

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) An RF amplifier circuit comprising an RF amplifying device having a first input terminal ~~(E1)~~, a second input terminal ~~(E2)~~ and an output terminal ~~(E3)~~, means for applying to the first input terminal an input RF signal I to be amplified, means for generating and applying to the second input terminal a threshold signal T, and the amplifying device being operable to produce at the output terminal an output signal O which has a high finite value providing a Boolean '1' value when the instantaneous value of the amplitude of I is greater than the threshold signal T and a low finite value providing a Boolean '0' value when the instantaneous value of the amplitude of the input RF signal I is less than the threshold signal T,

wherein the threshold signal T is dynamically varied in a manner adapted to ~~linearise~~ linearize the relationship in at least part of its range between the amplitude of the output signal O and the amplitude of the input RF signal I.

2. (currently amended) An RF amplifier circuit according to claim 1 wherein the means for generating and applying to the second input terminal a threshold signal T is operable to apply a non-constant transfer function to a signal representative of the input RF signal I.

3. (currently amended) An RF ~~amplifier~~ amplifying circuit according to claim 1 ~~or claim 2~~ and which has a bandwidth of at least five times, ~~preferably at least ten times,~~ greater than the mean operating frequency of the input RF I signal which it is operable to amplify.

4. (currently amended) An RF amplifier circuit according to claim 1, ~~claim 2 or claim 3~~ and wherein the output terminal is connected to a low pass filter operable to filter out harmonics higher than the first harmonic in the output signal O.

5. (currently amended) An RF amplifier circuit according to claim 1 ~~any one preceding claim~~ and wherein the threshold signal T is controlled to be a variable signal having a constant sign.

6. (currently amended) An RF ~~amplifier~~ amplifying circuit according to claim 1 ~~any one of the preceding claims~~ and wherein the threshold signal T is in operation dynamically varied as a function of the input RF signal I by sampling the input RF signal I prior to application to the amplifying device, the means for generating and applying to the second input terminal a the threshold signal T including a feed forward loop which includes means for deriving at least part of the threshold signal T from the input RF signal I.

7. (currently amended) An RF ~~amplifier~~ amplifying circuit according to claim 1 ~~any one of the preceding claims~~ and wherein the threshold signal T is ~~in operation~~ dynamically varied as a function of the output signal O by sampling the output signal O produced by the amplifying device, and wherein optionally after further processing, the means for generating and applying to the second input terminal a the threshold signal T including further comprises a feedback loop which ~~includes means for providing as the threshold signal T~~ derives a signal ~~derived at least in part from the sampled output signal O.~~

8. (currently amended) An RF amplifier circuit according to claim 1 ~~any one of the preceding claims~~ wherein the means for ~~providing the~~ generating and applying to the second input terminal a threshold signal T is operable to produce from the input RF sampled signal I ~~or signals~~ a signal which is related to ~~the~~ an envelope of the ~~sampled~~ input RF signal I.

9. (currently amended) An RF ~~amplifier~~ amplifying circuit according to claim 1 ~~any one of the preceding claims~~ and wherein the means for generating and applying to the second input terminal a the threshold signal T ~~includes~~ further comprises a digital signal processor operable to calculate from modulation information applied to produce the input RF signal I a form of the input RF signal I.

10. (currently amended) An RF ~~amplifier-amplifying~~ circuit according to claim ~~9~~ 8 and wherein the circuit ~~includes~~ further comprises a digital signal processor operable to produce modulation information for use in modulation to form the input RF signal I and also to carry out calculations using the modulation information to derive at least part of the threshold signal T.

11. (currently amended) An RF ~~amplifier-amplifying~~ circuit according to claim 1 ~~any one of the preceding claims and~~ wherein the means for generating and applying to the secnd input terminal a the threshold signal T ~~includes~~ further comprises:

(i) a signal peak monitor which is operable to measure ~~the~~ a value of ~~the~~ a peak of a signal being sampled and produces a peak envelope signal,

(ii) an ~~A to D~~ (analogue to digital) converter which is operable to digitise the peak envelope signal;

a digital signal processor which is operable to apply a transform function to the digitised peak envelope signal; and

a ~~D to A~~ (digital to analogue) converter which is operable to convert the digitally transformed signal produced by the digital signal processor back into a waveform suitable for use as the threshold signal T ~~or a component thereof~~.

12. (currently amended) An RF ~~amplifier-amplifying~~ circuit according to claim 11 ~~and~~ wherein the means for generating and applying to the secnd input terminal a the threshold signal T ~~also includes~~ further comprises an amplifier or a plurality of amplifiers to amplify the signal ~~being processed~~ to produce a the ~~variable~~ threshold signal T which is variable.

13. (currently amended) An RF ~~amplifier-amplifying~~ circuit according to claim 11 ~~any one of the preceding claims and~~ wherein the means for generating and applying to the secnd input terminal a the threshold signal T is operable to apply proportional, derivative and integral control to produce the threshold signal T.

14. (currently amended) An RF ~~amplifier-amplifying~~ circuit according to claim 11 ~~any one of the preceding~~ which stores corresponding values of the signal before and after application of the transfer function.

15. (currently amended) An RF ~~amplifier-amplifying~~ circuit according to claim 1 ~~any one of the preceding claims and~~ which is such that a plot of amplitude of the output signal O against amplitude of the input RF signal I is linear over at least 90% of its range.

16. (currently amended) An RF ~~amplifier-amplifying~~ circuit according to claim 1 ~~any one of the preceding claims and~~ wherein the amplifying device employed in the circuit is arranged in a class C configuration modified so that in operation the input RF signal I and the threshold signal T are applied together via separate input terminals to be combined at a single electrode of the amplifying device.

17. (currently amended) An RF ~~amplifier-amplifying~~ circuit according to claim 1 ~~any one of the preceding claims and~~ wherein the amplifying device comprises a solid state amplifying device.

18. (currently amended) An RF ~~amplifier-amplifying~~ circuit according to claim 1 ~~any one of the preceding claims and~~ wherein in operation the threshold signal T is applied as a variable bias to the amplifying device or is combined with the input RF signal I at an input to the amplifying device.

19. (currently amended) An RF ~~amplifier-amplifying~~ circuit according to claim 1 ~~any one of the preceding claims and~~ wherein the amplifier circuit includes at least two ~~two or more~~ amplifying devices mutually connected in series or in parallel.

20. (currently amended) An RF amplifier circuit according to claim 1 ~~wherein the amplifier circuit is used in a communications transmitter which includes an amplifier circuit according to claim 1 any one of the preceding claims.~~

21. (currently amended) An RF amplifier circuit according to claim 1 wherein the amplifier circuit is used ~~communications transmitter according to claim 20 and which is incorporated in a mobile station or a base transceiver station for use in a mobile communications.~~

22. (currently amended) An RF amplifier circuit according to claim 1 wherein the amplifier circuit ~~communications transmitter according to claim 21 and which is incorporated in a mobile station or a base transceiver station for use in a mobile communications system~~ is operable to employ phase modulated RF signals.

23. (currently amended) An RF amplifier circuit according to claim 1 wherein the amplifier circuit ~~communications transmitter according to claim 22 and which is incorporated in a mobile station or a base transceiver station for use in a mobile communications system~~ operable according to TETRA standards.

24. (currently amended) An RF amplifier circuit according to claim 1 wherein the amplifier circuit ~~communications transmitter according to claim 23 and wherein the amplifier circuit is~~ operable to provide a linear response in an output signal strength range of at least 70dB.